



## MATHS

### NCERT - NCERT Mathematics(HINGLISH)

### CONGRUENCE OF TRIANGLES

#### Exercise 7.2

1. If  $\triangle ABC$  and  $\triangle PQR$  are to be congruent, name one additional pair of corresponding parts. What criterion did you use ?



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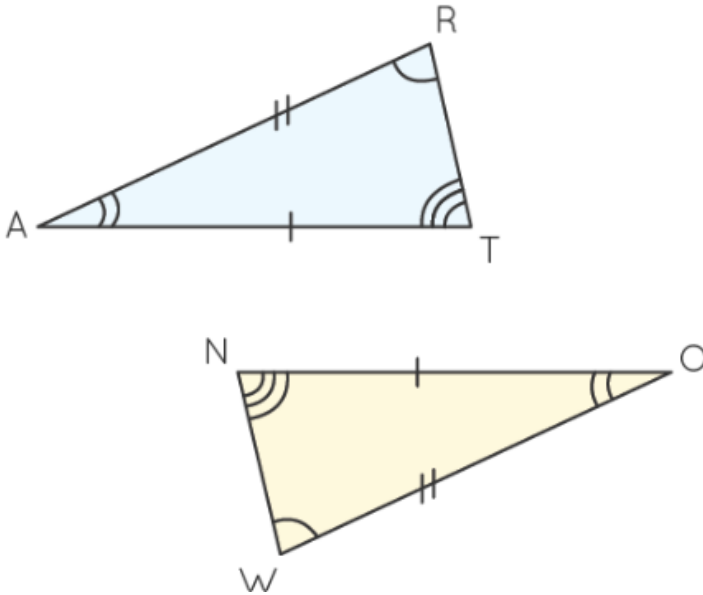
2. In  $\triangle ABC$ ,  $\angle A = 30^\circ$ ,  $\angle B = 40^\circ$  and  $\angle C = 110^\circ$

In  $\triangle PQR$ ,  $\angle P = 30^\circ$ ,  $\angle Q = 40^\circ$  and  $\angle R = 110^\circ$

A student says that  $\triangle ABC \cong \triangle PQR$  by AAA congruence criterion. Is he justified? Why or why not?

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3. In the figure, the two triangles are congruent. The corresponding parts are marked. We can write  $\triangle RAT \cong ?$



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4. Complete the congruence statement :  $\triangle BCAE$ ?



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5. In a squared sheet, draw two triangles of equal areas such that (i) the triangles are congruent. (ii) the triangles are not congruent. What can you say about their perimeters?



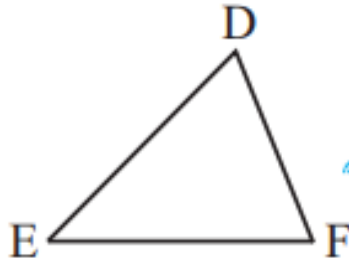
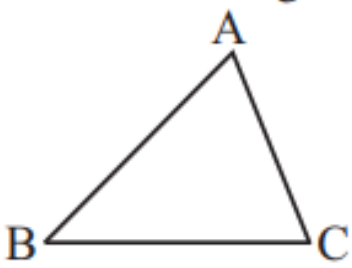
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6. (a) Given:  $AC = DF$

$AB = DE$

$BC = EF$

So,  $\triangle ABC \cong \triangle DEF$

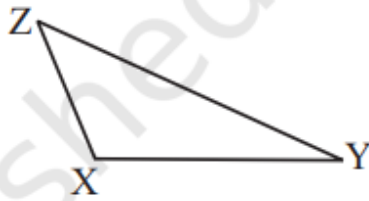
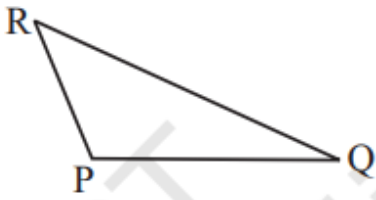


(b) Given:  $ZX = RP$

$RQ = ZY$

$\angle PRQ = \angle XZY$

So,  $\Delta PQR \cong \Delta XYZ$

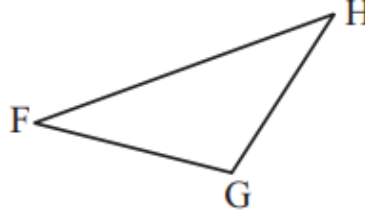
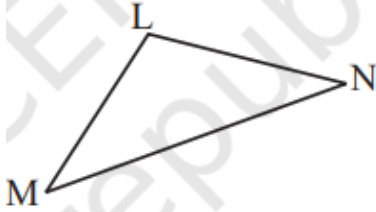


(c) Given:  $\angle MLN = \angle FGH$

$\angle NML = \angle GFH$

$ML = FG$

So,  $\Delta LMN \cong \Delta GFH$

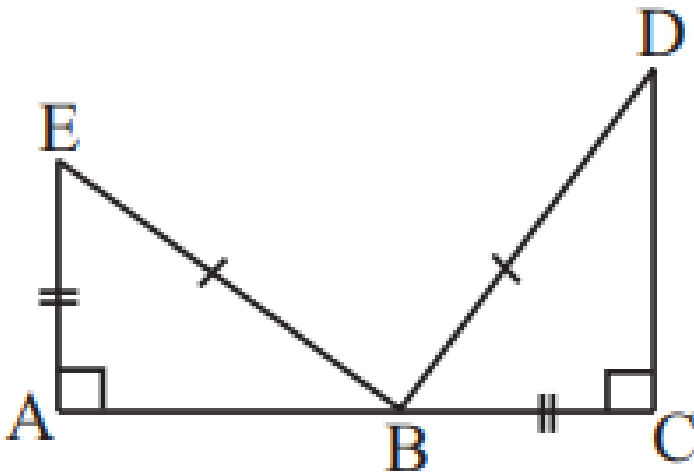


(d) Given:  $EB = DB$

$AE = BC$

$\angle A = \angle C = 90^\circ$

So,  $\triangle ABE \cong \triangle CDB$



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7. You want to show that  $\triangle ART \cong \triangle PEN$ ,

(a) If you to use *SSS* criterion, then need to show

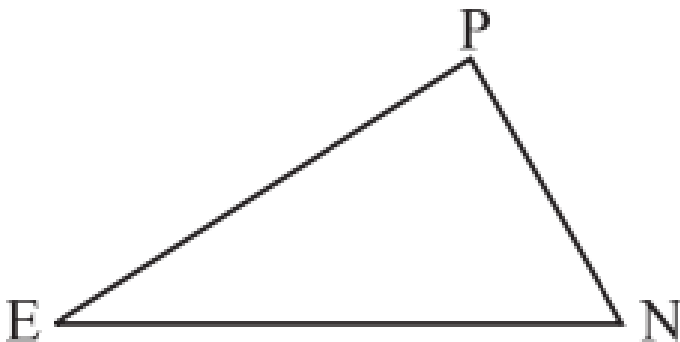
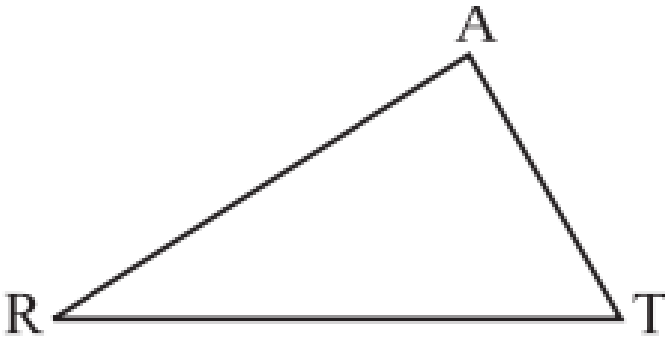
(i)  $AR =$  (ii)  $RT =$  (iii)  $AT =$

(b) If it is given that  $T = N$  and you are to use  $SAS$  criterion, you need to have

(i)  $RT =$  and (ii)  $PN =$

(c) If it is given that  $AT = PN$  and you are to use  $ASA$  criterion, you need to have

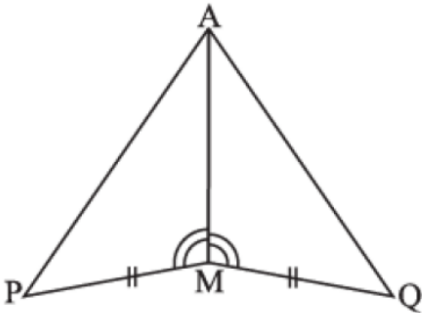
(i) ? (ii) ?



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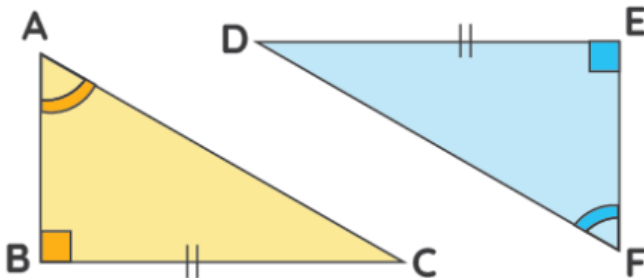
8. You have to show that  $\triangle AMP \cong \triangle AMQ$ . In the following proof, supply the missing reasons

Steps	Reasons
(i) $PM = QM$	(i) ...
(ii) $\angle PMA = \angle QMA$	(ii) ...
(iii) $AM = AM$	(iii) ...
(iv) $\triangle AMP \cong \triangle AMQ$	(iv) ...



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9. Explain, why  $\triangle ABC \cong \triangle FED$





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## Exercise 7 1

1. Complete the following statements:

(a) Two line segments are congruent if \_\_\_\_\_.

(b) Among two congruent angles, one has a measure of  $70^\circ$ ; the measure of the other angle is \_\_\_\_\_.

(c) When we write  $\angle A = \angle B$ , we actually mean \_\_\_\_\_



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2. If  $\triangle ABC \cong \triangle FED$  under the correspondence  $ABC \leftrightarrow FED$ , write all the corresponding congruent parts of the triangles



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3. Give any two real-life examples for congruent shapes





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4. If  $\triangle DEF \cong \triangle BCA$ , write the part(s) of  $\triangle BCA$  that correspond to

(i)  $\angle E$  (ii)  $\overline{EF}$  (iii)  $\angle F$  (iv)  $\overline{DF}$



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## Solved Examples

1. Given below are measurements of some parts of two triangles. Examine whether the two triangles are congruent or not, using RHS congruence rule. In case of congruent triangles, write the result in symbolic form

$\triangle ABC$	$\triangle PQR$
(i) $\angle B = 90^\circ$ , $AC = 8\text{cm}$ , $AB = 3\text{cm}$	$\angle P = 90^\circ$ , $PR = 3\text{cm}$
(ii) $\angle A = 90^\circ$ , $AC = 5\text{cm}$ , $BC = 9\text{cm}$	$\angle Q = 90^\circ$ , $PR = 8\text{cm}$

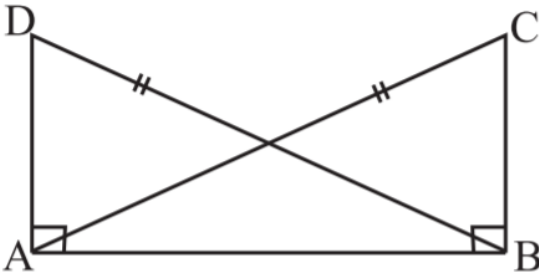


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2. In Fig 7.31,  $DA \perp AB$ ,  $CB \perp AB$  and  $AC = BD$ . State the three pairs of equal parts in  $\triangle ABC$  and  $\triangle DAB$ . Which of the following statements is meaningful?

(i)  $\triangle ABC \cong \triangle BAD$

(ii)  $\triangle ABC \cong \triangle ABD$

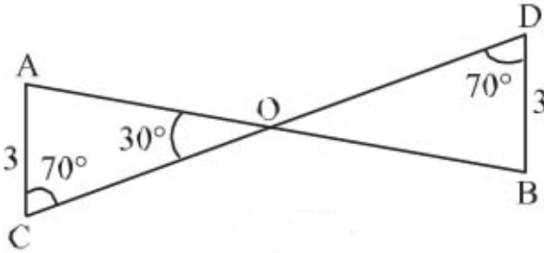


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3. By applying  $ASA$  congruence rule, it is to be established that  $\triangle ABC \cong \triangle QRP$  and it is given that  $BC = RP$ . What additional information is needed to establish the congruence?

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4. In the given figure, can you use *ASA* congruence rule and conclude that  $\triangle AOC \cong \triangle BOD$ ?



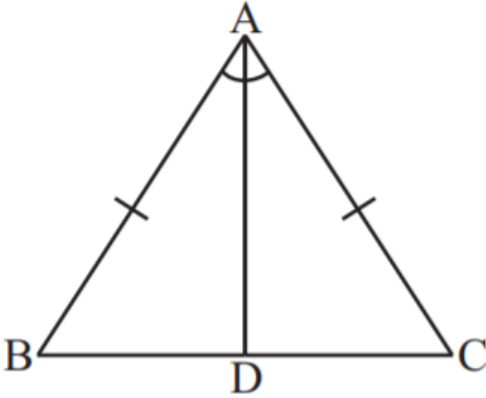
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5. Given below are measurements of some parts of two triangles. Examine whether the two triangles are congruent or not, by using *SAS* congruence rule. If the triangles are congruent, write them in symbolic form.

$\triangle ABC$	$\triangle DEF$
(a) $AB = 7\text{cm}, BC = 5\text{cm}, \angle B = 50^\circ$	$DE = 5\text{cm}, EF = 7\text{cm}, \angle E = 50^\circ$
(b) $AB = 4.5\text{cm}, AC = 4\text{cm}, \angle A = 60^\circ$	$DE = 4\text{cm}, FD = 4.5\text{cm}, \angle D = 60^\circ$
(c) $BC = 6\text{cm}, AC = 4\text{cm}, \angle B = 35^\circ$	$DF = 4\text{cm}, EF = 6\text{cm}, \angle F = 35^\circ$

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6. In the given figure,  $AB = AC$  and  $AD$  is the bisector of  $\angle BAC$ . (i) State three pairs of equal parts in triangles  $ADB$  and  $ADC$ . (ii) Is  $\triangle ADB \cong \triangle ADC$ ? Given reasons. (iii) Is  $\angle B = \angle C$ ? Given reasons

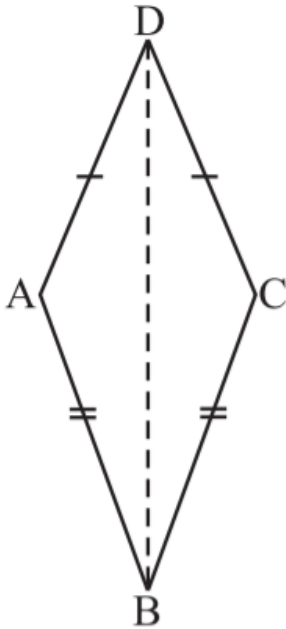


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7. In triangles  $ABC$  and  $PQR$ ,  $AB = 3.5\text{cm}$ ,  $BC = 7.1\text{cm}$ ,  $AC = 5\text{cm}$ ,  $PQ = 7.1\text{cm}$ ,  $QR = 3.5\text{cm}$ ,  $PR = 5\text{cm}$ . Examine whether the two triangles are congruent or not. If yes, write the congruence relation in symbolic form.

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8. In the given figure,  $AD = CD$  and  $AB = CB$ . (i) state the three pairs of equal in  $\triangle ABD$  and  $\triangle CBD$ . (iii) Is  $\triangle ABD \cong \triangle CBD$ ? Why or why not? (iii) Does  $BD$  bisect  $\angle ABC$ ? Given reasons



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9.  $\triangle ABC$  and  $\triangle PQR$  are congruent under the correspondence :  $ABC \rightarrow RQP$  write the parts of  $\triangle ABC$  that correspond to ? (i)  $\overline{PQ}$  (ii)  $\angle Q$  (iii)  $\overline{RP}$



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